

REMARKS

Claims 1-8 have been cancelled. Claims 9-18 have been amended. Claims 19-28 have been added. Therefore, claims 9-28 are currently pending in the application. In view of the following remarks, Applicants respectfully request withdrawal of the rejections and forwarding of the application on to issuance.

The § 102 Rejections

Claims 13-18 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Hideki et al (JP 2001/243655) (hereinafter “Hideki”).

The § 103 Rejections

Claims 9-12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Hideki in view of Yamada et al (US Publication 2001/0017833).

Claims 9-16

Claim 9 recites a method for recording data in an optical recording medium. The optical recording medium includes a substrate, a protective layer and a plurality of information recording layers between the substrate and the protective layer. A laser beam is projected onto the plurality of information recording layers via a light incidence plane constituted by either the substrate or the protective layer, thereby recording data in the plurality of information recording layers. The method for recording data in an optical recording medium comprises projecting a laser beam whose power is modulated between at least three levels including a level corresponding to a recording power, a level corresponding to an intermediate power lower than the recording power and a level corresponding to a bottom power lower than the intermediate power onto at least one information recording layer other than an information recording layer farthest from the light incidence plane. The method also comprises forming a recording mark in the at least one information recording layer other than the information recording layer farthest from the light incidence plane, thereby recording data therein. The power of the laser beam is set to the bottom power when it is projected onto the end portion of each of the recording marks.

The power of the laser beam is modulated so that a time period during which the power of the laser beam is set to the bottom power for forming the end portion of each of the recording marks becomes longer as a linear recording velocity is higher.

In making out its rejection of claim 9, the Office states that Hideki does not disclose a “method for recording data in an optical recording medium, wherein the power of the laser beam is modulated so that a time period during which the power of the laser beam is set to the bottom power . . . for forming the end portion of each of the recording marks becomes longer as a linear recording velocity is higher. . . .” Applicant agrees.

However, the Office then argues that Yamada discloses the claimed subject matter. Specifically, the Office appears to equate Applicant’s “bottom power” with Yamada’s power level e shown in Figure 1. In addition, the Office argues that Yamada’s Figure 1a represents a low linear recording velocity and that Yamada’s Figure 1d represents a high linear recording velocity. Based on this logic, the Office further argues that the time period during which power of a laser beam is set to e becomes longer as the recording linear velocity is higher (i.e., the Office argues that e has a longer duration in Figure 1d than it does in Figure 1a).

Applicant respectfully disagrees and traverses the rejection for at least three reasons. First, in paragraph 14, Yamada states that power levels (a and c) $\geq e \geq (b$ and $d)$. Thus, power level e clearly corresponds to an intermediate level rather than to a bottom level. Second, nowhere does Yamada indicate that the recording linear velocity is lower in Figure 1a than it is in Figure 1d. Third, even if Figure 1d represented a higher recording linear velocity, it doesn’t appear that the time period during which the laser beam is set to power level e is longer than the corresponding time period in Figure 1a.

Furthermore, not only does Yamada not disclose the subject matter of claim 9, Yamada actually teaches directly away from Applicant’s claimed subject matter. In Figures 2a, 2b, and 2c, Yamada shows recording waveforms for three different recording linear velocities (4.8 m/s, 9.6 m/s, and 12.0 m/s, respectively). As shown in Figure 2, the time period during which the power level is at its lowest (i.e., power levels b,d) is actually **shorter** when the linear recording velocity is higher.

Accordingly, for at least these reasons, claim 9 is allowable.

Claims 10-16 depend from claim 9 and, as such, are allowable as depending from an allowable base claim. These claims are also allowable for their recited features, which, in combination with those recited in claim 9, are neither shown nor suggested by the references as cited and applied by the Office.

For example, **claim 10** recites a method for recording data in an optical recording medium in accordance with claim 9, wherein the level of the bottom power is set so that a region of the at least one information recording layer other than the information recording layer farthest from the light incidence plane heated by irradiation with the laser beam whose power is set to the recording power can be cooled during irradiation with the laser beam whose power is set at the bottom power. In combination with claim 9, the time period during which the cooling can take place becomes longer as a linear recording velocity is higher.

The Office rejects claim 10 with the same rationale it used in rejecting claim 9 and again relies on Yamada. However, in reference to Figure 2, Yamada states in paragraphs 79 and 80:

[0079] *At a low recording linear velocity of 4.8 m/s*, an excessive thermal damage is reduced by decreasing the recording pulse width in the mp portion, and a *cooling period in the mp portion is lengthened*, whereby a mark with minimum jitters in the edges thereof can be recorded.

[0080] In contrast, *at a high recording linear velocity of 12.0 m/s*, a sufficient amount of energy is applied to the recording layer to cause a phase change in the recording layer by increasing the recording pulse width in the mp portion, so that even though the *cooling period in the mp portion is shortened* due to the high recording linear velocity, rapid cooling of the recording layer can be properly performed, whereby a mark with minimum jitters in the edges thereof can be recorded.

Therefore, Yamada again teaches directly away from Applicant's claimed subject matter. For at least this reason, claim 10 is also allowable.

As another example, **claims 13 and 14** both recite a method for recording data in an optical recording medium, wherein data are recorded by employing an objective lens and a

laser beam whose numerical aperture NA and wavelength λ satisfy $\lambda/NA \leq 640$ nm, and projecting the laser beam onto the optical recording medium via the objective lens.

In making out the rejection of claims 13 and 14, the Office argues that Hideki discloses the claimed subject matter in paragraph 45. However, Applicant can find no such teaching in paragraph 0045. Rather, in paragraph 67, Hideki discloses a laser beam having a wavelength of 405 nm and an optical system having a numerical aperture of 0.6. In this case, $\lambda/NA = 675$, which clearly does not disclose or suggest Applicant's claimed subject matter. For at least this reason, claims 13 and 14 are also allowable.

Claims 17-28

Claim 17 recites an apparatus for recording data in an optical recording medium. Claim 18 recites an optical recording medium.

Hideki neither discloses nor suggests that the optical recording medium is recorded with data for setting data recording conditions necessary for projecting a laser beam whose power is modulated between at least three levels including a level corresponding to a recording power, a level corresponding to an intermediate power lower than the recording power, and a level corresponding to a bottom power lower than the intermediate power onto the first information recording layer 2 when a recording mark is to be formed in the first information recording layer 2, thereby recording data therein.

Therefore, Applicants believe that the present claims 17 and 18 are allowable over Hideki.

Claims 17 and 18 have been amended to contain limitations not found in the art for the same reasons explained with respect to claim 9. Although claims 17 and 18 are not identical to that of claim 9, both claims 17 and 18 are allowable based on the above discussion of the differences in similar limitations found in amended claim 9.

Claims 19-28 depend from claim 18 and, as such, are allowable as depending from an allowable base claim. These claims are also allowable for their recited features, which, in combination with those recited in claim 18, are neither shown nor suggested by the references as cited and applied by the Office.

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Conclusion

Applicant respectfully submits that all pending claims are in condition for allowance. Accordingly, Applicants request that a Notice of Allowance be issued. If the Office's next anticipated action is to be anything other than a Notice of Allowance, Applicant requests that the undersigned be contacted for scheduling a telephone interview.

The Director is authorized to charge any additional fees due by way of this Amendment, or credit any overpayment, to our Deposit Account No. 19-1090.

Respectfully submitted,
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